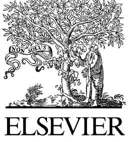

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GDP growth and currency valuation: The case of the dollar

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Abstract

One popular view on the strength of the US dollar around the turn of the century is that the higher growth in the US compared to Europe had stimulated foreigners to buy American assets, thereby driving up the exchange rate. In this paper a modified portfolio balance model is presented, in which it is shown that the impact of output growth on the exchange rate depends crucially on the origin of this growth. An improvement of the output gap is shown to actually depress the exchange rate whereas an increase in potential output growth leads to an appreciation, especially if this improvement is likely to be persistent. In an empirical example, it is shown that the equilibrium real dollar rate is indeed positively affected by high trend growth in the US, whereas it is negatively affected by a positive output gap. The model outperforms the random walk in forecasting future real dollar rates one to eight quarters ahead.
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1. Introduction

Many observers have been surprised by the continuous rise of the US dollar between 1995 and 2001 despite the large deficit on the US current account. One popular explanation for this strength is the so-called prosperous economy view. According to this view the dollar has been appreciating because international investors preferred American assets in order to profit from the presumed higher growth

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potential in the US compared to Europe or Japan.[1] The theoretical foundation for this view is not clear, however, as the higher growth potential of the US should already be reflected in the price of US assets (Sinn and Westermann, 2001). Moreover, the theory does not explain the ever increasing willingness of foreigners to hold American assets, necessary to finance the deficit on the US current account.

In this paper an attempt is made to theoretically justify the presumed link between output growth and real appreciation. For this purpose a modified portfolio-balance rational-expectations exchange rate model is developed. As usual, any surplus or deficit on the current account has to be balanced by the capital account. The capital account contains two elements in our model: net foreign direct investment and net portfolio investment. All of these elements are affected by developments in output growth, the extent to which depends crucially, however, on the composition of this growth. In the theoretical model a distinction is made between changes in the output gap on the one hand and changes in potential output on the other. With respect to the latter two different kinds of shocks are modeled: one-time shocks and persistent trend growth shocks. The current account is assumed to depend on the real exchange rate and the output gap, net direct investment depends crucially on trend growth, whereas desired net portfolio investment depends on expected deviations from uncovered interest parity. After calibrating the model for the US economy, the model is solved using model-consistent forward-looking expectations for the exchange rate. It turns out that positive demand shocks – that affect the output gap, but not potential output – result in a depreciation of the dollar, whereas supply shocks, especially persistent ones, lead to an appreciation.

The theoretical model can thus offer two explanations for the persistent strength of the dollar despite the large deficit on the current account. First, the continuous outflow of dollars due to the deficit on the current account is partly compensated by the inflow due to net foreign direct investment. Second, as the output gap and trend growth are not observable, the prolonged period of high growth without much inflationary pressures might have resulted in a gradual update on the likely composition of output growth.[2] Indeed, as the prosperous period of high growth prolonged, more and more people started to believe in a New Economy in which the output gap would be less pronounced and potential output growth would be permanently higher than before. Both the lower presumed output gap and the higher trend growth positively affected the dollar.

In an empirical application on the real dollar rate, it is shown that the equilibrium real value of the dollar is indeed positively affected by high trend growth in the US, whereas a positive output gap has a negative impact. The model outperforms the random walk in forecasting real exchange rate changes one to eight quarters ahead. The explanatory power of the relationship is relatively weak, however. The real exchange rate may occasionally deviate from its predicted value by more than 20%. At the end of 2004 the value of the US dollar seemed to be close to equilibrium.

The rest of the paper is structured as follows. Section 2 provides some background on recent developments, primarily in the US. In Section 3 the theoretical model will be presented. The model will be calibrated for the US and the results are shown by means of impulse response functions. In Section 4 the predictions of the theoretical model will be confronted with

[1] For the euro dollar rate, Corsetti and Pesenti (1999) were among the first to show the influence of growth differentials. They conclude that cyclical divergence seems to be the root cause for the slide of the euro, but do not present a formal theory explaining this phenomenon. Previously, Tatom (1987, 1995) has shown the importance of productivity differentials in explaining exchange rate changes in the 1980s.

[2] This argument has previously been used by Brunner et al. (1980). They show that if agents cannot observe the persistence of shocks as they occur, a permanent reduction in productivity leads to stagflation and persistent unemployment even if all expectations are rational and all markets clear.

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